Zoogeography of Termites of Assam Region, India, with remarks on Speciation

BY

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I. Introduction

The 'Assam Region' of eastern India covers an area of about 1,04,048 sq. miles and is composed of five administrative units, namely the Assam State (50,143 sq. miles), and four centrally administered areas called the North-East Frontier Agency (NEFA) (34,969 sq. miles), Manipur (8628 sq. miles), the Naga Hills and Tuensang Area (6276 sq. miles), and Tripura (4032 sq. miles). It presents a remarkable topographic and ecological variety. Over one-half its area is covered with hills and mountains, some of them of great height and perpetually snow-bound. The remaining areas are either cultivated or covered with dense evergreen forests. A detailed account of the plant community in a restricted area (the Imphal Valley, Manipur) has been given by Roonwal (1949*a*, pp. 110-116). The climate is 'humid tropical' in the plains, and 'temperate' in the hills. The rainfall is heavy all over the area.

The termite fauna of the Assam Region has until recently been studied in a more or less desultory way. The following authorities have contributed to its study: Holmgren (1913), Silvestri (1914), Gardner (1944), Snyder (1949), and more recently Roonwal & Pant (1953), Roonwal & Sen-Sarma (1956, 1960), and Roonwal & Chhotani (1959-62). Snyder (1949) in his world catalogue listed only eight species from the Assam Region. As a result of intensive work subsequently, Roonwal & Chhotani (1962*a*) listed 34 species, 13 of which were new. This last paper also gives a map of the area and a full list of references on the termites of that region.

In the present paper are discussed the zoogeographical significance of the termite fauna of the Assam Region and its bearing on the speciation problem.

II. Taxonomic Distribution

Three of the known 6 families of living termites are represented in the Assam Region, viz. the families Kalotermitidae, Rhinotermitidae, and Termitidae. The families not represented are : Mastotermitidae (Australian only), Hodotermitidae, and Indotermitidae (the peculiar family recently described by Roonwal & Sen-Sarma (1960) from Burma; *vide* also Roonwal 1958, for a preliminary account). A total of 16 genera and 34 species is represented (Table), the distribution of the genera and the number of species in each of them being as follows :

Fam. I. KALOTERMITIDAE (1 subfamily, 2 genera, 2 species)	
Subfam. (i) KALOTERMITINAE	
1. *Neotermes* Holmgren	.. 1 sp.
2. *Cryptotermes* Banks	.. 1 sp.
Fam. II. RHINOTERMITIDAE (3 subfamilies, 3 genera, 6 species)	
Subfam. (i) HETEROTERMITINAE	
3. *Reticulitermes* Holmgren	.. 2 spp.
Subfam. (ii) COPTOTERMITINAE	
4. *Coptotermes* Wasmann	.. 3 spp.
Subfam. (iii) RHINOTERMITINAE	
5. *Parrhinotermes* Holmgren	.. 1 sp.
Fam. III. TERMITIDAE (4 subfamilies, 11 genera, 26 species)	
Subfam. (i) AMITERMITINAE	
6. *Anoplotermes* Müller	.. 1 sp.
7. *Speculitermes* Wasmann	.. 1 sp.
8. *Synhamitermes* Holmgren	.. 1 sp.
9. *Microcerotermes* Silvestri	.. 1 sp.
Subfam. (ii) TERMITINAE	
10. *Pseudocapritermes* Kemner	.. 1 sp.
11. *Capritermes* Wasmann	.. 2 spp.
Subfam. (iii) MACROTERMITINAE	
12. *Macrotermes* Holmgren	.. 1 sp.
13. *Odontotermes* Holmgren	.. 8 spp.
14. *Hypotermes* Holmgren	.. 3 spp.
15. *Microtermes* Wasmann	.. 3 spp.
Subfam. (iv) NASUTITERMITINAE	
16. *Nasutitermes* Dudley	.. 4 spp.
Total	.. 34 spp.

As is usual in the Indo-Malayan Region, the family most richly represented is the Termitidae, with 4 subfamilies, 11 genera, and 26 species (comprising 69% of the genera and 76% of the species known from the Assam Region). The genus best represented is *Odontotermes* (with 8 species or 24% of the total). The three closely allied genera *Odontotermes*, *Hypotermes*, and *Microtermes* contain among themselves 14

species or 41% of the total. The genus *Nasutitermes* is also well represented, with 4 species (12% of the total).

III. Zoogeography and Speciation (Table)

For a zoogeographical analysis, the species are arranged below under the following seven categories, while a more detailed distribution is given in the Table at pp. 26-31 below :

Category	No. of species (and % of total : 34)
(i) Species endemic to the Assam Region (Assam State, NEFA, Naga Hills and Tuensang Area, Manipur, and Tripura)	20 (58·8%)
(ii) Species common with peninsular India (below *c.* 20°N. latitude) only	none
(iii) Species common with whole of India (including peninsular India) and with E. Bengal (E. Pakistan) only	6 (17·6%)
(iv) Species common with Burma only	1 (3%)
(v) Species common with Ceylon only	none
(vi) Species common with the Indo-Malayan Region (India, Pakistan, Ceylon, Burma, Malaya, Indonesia), either whole or in part	16 (47%)
(vii) Species common with the Palaearctic region (central China) only	1 (3%)

(i) *Species endemic to the Assam Region (Assam State, NEFA, Naga Hills and Tuensang Area, Manipur and Tripura) :*

1. *Neotermes megaoculatus lakhimpuri* Roonwal & Sen-Sarma
2. *Reticulitermes saraswati* Roonwal & Chhotani
3. *Parrhinotermes khasii* Roonwal & Sen-Sarma
4. *Anoplotermes shillongensis* Roonwal & Chhotani
5. *Speculitermes cyclops rongrensis* Roonwal & Chhotani
6. *Pseudocapritermes tikadari* Roonwal & Chhotani
7. *Capritermes latignathus durga* Roonwal & Chhotani
8. *Macrotermes khajuriai* Roonwal & Chhotani
9. *Odontotermes assamensis* Holmgren
10. *Odontotermes flavomaculatus* Holmgren & Holmgren
11. *Odontotermes giriensis* Roonwal & Chhotani
12. *Odontotermes horai* Roonwal & Chhotani
13. *Odontotermes kapuri* Roonwal & Chhotani
14. *Hypotermes nongpriangi* Roonwal & Sen-Sarma
15. *Microtermes imphalensis* Roonwal & Chhotani
16. *Microtermes umsae* Roonwal & Chhotani
17. *Nasutitermes cherraensis* Roonwal & Chhotani
18. *Nasutitermes garoensis* Roonwal & Chhotani
19. *Nasutitermes kali* Roonwal & Chhotani
20. *Nasutitermes moratus* (Silvestri)

(ii) *Species common with peninsular India (below c. 20° N. latitude) only :*

None

(iii) *Species common with whole of India (including peninsular India) and with E. Bengal (E. Pakistan) only :*

1. *Neotermes megaoculatus* Roonwal & Sen-Sarma
   (The subspecies *N. m. lakhimpuri* R. & S. is confined to Assam.)
2. *Cryptotermes bengalensis* Snyder[1]
3. *Coptotermes heimi* (Wasmann)
4. *Synhamitermes quadriceps* (Wasmann)
5. *Capritermes dunensis* Roonwal & Sen-Sarma
6. *Odontotermes parvidens* Holmgren & Holmgren

(iv) *Species common with Burma only :*

Coptotermes gestroi Wasmann

(v) *Species common with Ceylon only :*

None

(vi) *Species common with the Indo-Malayan Region (India, Pakistan, Ceylon, Burma, Malaya, Indonesia), either whole or in part :*

1. *Neotermes megaoculatus* Roonwal & Sen-Sarma
   (The subspecies *N. m. lakhimpuri* R. & S. is confined to Assam.)
2. *Cryptotermes bengalensis* Snyder
3. *Coptotermes gestroi* Wasmann
4. *Coptotermes heimi* (Wasmann)
5. *Coptotermes travians* Haviland
6. *Speculitermes cyclops* Wasmann (The subspecies *S. c. rongrensis* Roonwal & Chhotani is confined to Assam.)
7. *Synhamitermes quadriceps* (Wasmann)
8. *Microcerotermes heimi* Wasmann
9. *Capritermes dunensis* Roonwal & Sen-Sarma
10. *Capritermes latignathus* Holmgren (The subspecies *C. l. durga* Roonwal & Chhotani is confined to Assam.)
11. *Odontotermes feae* (Wasmann)
12. *Odontotermes horni* (Wasmann)
13. *Odontotermes parvidens* Holmgren & Holmgren
14. *Hypotermes obscuriceps* (Wasmann)
15. *Hypotermes xenotermitis* (Wasmann)
16. *Microtermes anandi* Holmgren

(vii) *Species common with Palaearctic region only*

Reticulitermes chinensis Snyder (Central China)

It will be seen from the analysis given above that the general zoo-geographical facies of the termite fauna of the Assam Region is, as is to be expected, overwhelmingly Indo-Malayan. Out of the 34 species

[1] Ahmad (1952, *Proc. 4th Pak. Sci Conf.*, Peshawar, Pt. 3, p. 71) regards *C. bengalensis* as a synonym of *C. havilandi* (Sjöstedt).

occurring in the Region, the only one which shows some Palaearctic affinities is *Reticulitermes chinensis* Snyder (syn. *R. assamensis* Gardner) which has been recorded, besides Assam, from the Szechuan Province in central China.

Causes of Speciation

A remarkably large proportion of species, 20 out of 34 or 58·8%, are endemic to the Assam Region. This indicates a high rate of speciation in this region which is ecologically characterized by either dense evergreen forests or hills cut up into innumerable small valleys. In both these ecological situations, the movements of termites (even of the winged ones) are relatively restricted by the dense forests or by high ranges. As a consequence, the termites are cut up into small or medium-sized populations which are confined to their patch of dense forest or their valley, and opportunities of inter-population mixing are few, i.e. the ' migration pressure ' is low. Thus, well-known ' population effects' are called into play in which, as has been shown in medium populations [the Wright-Dubinin Effect, *vide* Dubinin (1931), Dubinin & Romaschoff (1932), and Wright (1931-46)] and in small populations (the Roonwal Effect, *vide* Roonwal 1953, 1954) the variation-intensity is increased and the process of speciation speeded up (for a discussion of these effects, *vide* Roonwal 1947-54).

Of the non-endemic termite fauna, none is common with peninsular India only, and with Ceylon only ; 6 species (17.6%) are common with the whole of India (including E. Pakistan) only, 1 (3%) common with Burma only, and 16 (47%) common with the Indo-Malayan Region (either whole or in part). The species which are rather widely distributed over the Indo-Malayan Region are the following :

1. *Coptotermes gestroi* Wasmann (India ; Burma)
2. *Coptotermes heimi* (Wasmann) (India ; W. Pakistan ; also probably middle Java, Indonesia)
3. *Coptotermes travians* Haviland (India ; Malaya ; Indonesia)
4. *Microcerotermes heimi* Wasmann (India ; Ceylon)
5. *Odontotermes feae* (Wasmann) (India ; Burma)
6. *Odontotermes horni* (Wasmann) (India ; Ceylon)
7. *Hypotermes obscuriceps* (Wasmann) (India ; Ceylon)
8. *Hypotermes xenotermitis* Wasmann (India ; Burma)
9. *Microtermes anandi* Holmgren (India ; Ceylon).

Three genera call for special comment :

Genus *Parrhinotermes* Holmgren is a small one comprising only 6 species, of which 5 are Indo-Malayan (India, Malaya, Indonesia) and one Australian. The single species from India, *P. khasii* R. & S., is from Assam and was described by Roonwal & Sen-Sarma (1956)—this was the first record of the genus from Indian territory.

Genus *Anoplotermes* Müller is characterized by the absence of the soldier caste, only workers and alates (reproductives) being present. It is a large genus, containing about 45 species of which the majority (73%) are Neotropical (South and Central America), a few (25%) Ethiopian (Africa), and only one *A. shillongensis* R. & C., which was recently discovered by Roonwal & Chhotani (1959, 1960*a*), is Indian (from Assam).

Like *Anoplotermes*, the closely allied but much smaller genus *Speculitermes* Wasmann is characterized by the virtual absence of the soldier caste. It has 7 species of which 4 (or 57·1%) are Neotropical and 3 (42·9%) Indo-Malayan. One subspecies, *S. cyclops rongrensis* Roonwal & Chhotani, is represented in Assam.

IV. Summary

1. The Assam Region of eastern India, comprising the five administrative units of Assam State, North-East Frontier Agency, Manipur, the Naga Hills and Tuensang Areas, and Tripura, is characterized by a remarkable variety of ecological environment. The plains and the lower areas are ' humid-tropical ' and are either cultivated or covered with dense evergreen forests. The hilly areas (which comprise over one-half the total area) are ' temperate '. The rainfall is heavy all over the area.

2. The termite fauna of the Assam Region has been studied fairly intensively in recent years, and a total of 16 genera and 34 species recorded.

3. Three termite families are represented, viz. Kalotermitidae, Rhinotermitidae, and Termitidae. The Termitidae contains the largest number of genera and species—11 genera (69%) and 26 species (76%).

4. The genus *Odontotermes* contains the largest number of species (8, or 24%).

5. The termite fauna has been analysed zoogeographically. A remarkably high proportion (20 species, or 58.8%) of the fauna is endemic, and has not been recorded elsewhere. No species is common with peninsular India only or with Ceylon only, and one species is common with Burma only. Six species (17.6%) are common with the Indian Region as a whole (including E. Bengal in E. Pakistan), and 16 species (47%) are common with the Indo-Malayan Region. Only one species (3%) is common with the Palaearctic Region (central China) only.

6. It is suggested that the very high proportion of endemic species (about 59%) is indicative of a high rate of speciation in the region. It is further suggested that this is due to the peculiar ecological conditions (dense forests and numerous hill ranges and valleys) which tend to cut up the distribution into small, semi-isolated populations, and this condition accelerates the variation-intensity in terms of the Wright-Dubinin and the Roonwal Effects.

References

DUBININ, N. P. (1931) : Genetico-automatic processes and their significance for the mechanism of organic evolution [*In Russian*]. *J. Biol. exp.* **7** : 463-479. Moscow.

——— & ROMASCHOFF, D. D. (1932) : Die genetische Struktur der Art and ihre Evolution [*In Russian, with German summary*]. *Biol. Zh.* **5** : 939-976. Moscow.

GARDNER, J. C. M. (1944) : New Termitidae from India and Burma. (Isoptera). *Indian J. Ent.* **6** (1 & 2) : 103-110. New Delhi.

HOLMGREN, N. (1913) : Termiten-studien. 4 Versuch einer systematischen Monographie der Termiten der orientalischen Region. *K. Sv. Vet. Akad. Handl.* **50**(2) : 1-276, 8 pls. Stockholm.

ROONWAL, M. L. (1947) : Evolutionary significance of periodicity of variation-intensity and population-flux in the Desert Locust. *Nature* **159** : 872-873. London.

——— (1949*a*) : Systematics, ecology and bionomics of mammals studied in connection with tsutsugamushi disease (scrub typhus) in the Assam-Burma War Theatre during 1945. *Trans. nation. Inst. Sci. India* **3** (2) : 67-122, 6 pls., 15 tables. Calcutta.

——— (1949*b*) : Modern trends in Systematics. Presidential Address to the Section of Zoology and Entomology, Indian Science Congress, 1949. *Proc. 36th Indian Sci. Congr.* (Allahabad, 1949), Pt. 2, Presidential Addresses, pp. 111-138. Calcutta.

——— (1953) : On a new evolutionary phenomenon : The sharp increase of intraspecific variation in minimum populations as evidenced by the Desert Locust. *Symposium on Organic Evolution* (March 1953) : *Programme & Abstracts of Papers* (National Inst. Sci. India) : 10-11. New Delhi.

——— (1954) : On a new evolutionary phenomenon : The sharp increase of intraspecific variation in minimum populations, as evidenced by the Desert Locust. *Rec. Indian Mus.* **51** (4) [Dec. 1953] : 481-526+6, 4 pls. (1 col.). Delhi.

——— (1958) : Recent work on termite research in India (1947-57). *Trans. Bose Res. Inst.* **22** : 77-100, 4 pls. Calcutta.

——— & CHHOTANI, O. B. (1959) : New Neotropical element (*Anoplotermes*) in Indian termite fauna. *Nature* **184** (4703) : 1967-1968. London.

——— (1960) : *Anoplotermes shillongensis*, sp. nov., a new termite from Assam, India. *Sci. & Cult.* **25** (12) : 701. Calcutta.

——— (1962*a*) : Termite fauna of Assam Region, eastern India. *Proc. nation. Inst. Sci. India* (B) **28** (4): 281-406, 26 pls. New Delhi.

ROONWAL, M. L., & CHHOTANI, O. B. (1962*b*) : Indian Species of the Termite Genus *Coptotermes*. pp. ix + 115, 18 pls. Indian Counc. Agric. Res., Ent. Monogr. No. 2. New Delhi.

——— (1962*c*) : A new neotropical element (*Anoplotermes*) in the Indian termite fauna, with a fuller description of the species from Assam. *Rec. Indian Mus.* **58** (3 & 4) : 159-168, 1 pl. Calcutta.

——— & PANT, G. D. (1953) : A Systematic Catalogue of the Main Identified Entomological Collection at the Forest Research Institute, Dehra Dun. Part 9. Order Isoptera. *Indian For. Leafl.* (*Ent.*) No. 121 (3) : 40-60. Delhi.

——— & SEN-SARMA, P. K. (1956) : Systematics of oriental termites (Isoptera). No. 3. Zoological Survey of India collections from India and Burma, with new termites of the genera *Parrhinotermes*, *Macrotermes*, *Hypotermes* and *Hospitalitermes*. *Indian J. agric. Sci.* **26** (1) : 1-38, New Delhi.

——— (1960) : Contributions to the Systematics of Oriental Termites. 407 pp. (65 pls.). Indian Counc. Agric. Res., Ent. Monogr. No. 1. New Delhi.

SILVESTRI, F. (1914) : Zoological results of the Abor Expedition. XXXIII. Termitidae. *Rec. Indian Mus.* **8** (5) : 425-435. Calcutta.

SNYDER, T. E. (1949) : Catalog of the termites (Isoptera) of the world. *Smiths. misc. Coll.* **112** : 490. Washington.

WRIGHT, S. (1931*a*) : Evolution in Mendelian populations. *Genetics* **16** : 97-159. Brooklyn, N. Y.

——— (1931*b*) : Statistical theory of evolution. *Proc. Amer. Stat. Assoc.* **26** (Suppl.) : 201-208.

——— (1932) : The roles of mutation, inbreeding, crossbreeding and selection in evolution. *Proc. 6th int. Congr. Genet.* (Ithaca) **1** : 356-366.

——— (1935) : Evolution in populations in approximate equilibrium. *J Genet.* **30** : 257-266. Cambridge.

——— (1940*a*) : The statistical consequences of Mendelian heredity in relation to speciation. pp. 161-183 in J. Huxley's *The New Systematics*. Oxford.

——— (1940*b*) : Breeding structure of populations in relation to speciation. *Amer. Nat.* **74** : 232-248. Lancaster.

——— (1946) : The differential equation of the distribution of gene frequencies. *Proc. nation. Acad. Sci.* **31** : 382-389. Washington.

TABLE

GEOGRAPHICAL DISTRIBUTION OF THE TERMITE SPECIES SO FAR RECORDED FROM THE ASSAM REGION

+ Present ; — Absent

Species	Distribution								Zoogeographical Status	Remarks
	Assam Region (Assam State, NEFA, Manipur, the Naga Hills & Tuensang Area, & Tripura)	Peninsular India (below *c.* 20°N. latitude)	Rest of India (not covered by cols. 2 & 3) and W. & E. Pakistan	Ceylon	Burma	Rest of Oriental Region	China	Elsewhere		
Fam. I. KALOTERMITIDAE										
1. *Neotermes megaoculatus lakhimpuri* Roonwal & Sen-Sarma	+	—	—	—	—	—	—	—	Indo-Malayan	The typical subspecies, *N. m. megaoculatus* Roonwal & Sen-Sarma, occurs in the foothills of the western Himalayas, at Dehra Dun (U.P., India)
2. *Cryptotermes bengalensis* Snyder [= ? *C. havilandi* Sjdt.]	+	—	+ (W. Bengal & E. Pakistan)	—	—	—	—	—	Indo-Malayan	..
Fam. II. RHINOTERMITIDAE										
3. *Reticulitermes chinensis* Snyder (syn. *R. assamensis* Gardner)	+	—	—	—	—	—	+ (Szechuan Province)	—	Indo-Malayan (Also Palaearctic)	..

4. *Reticulitermes saraswati* Roonwal & Chhotani	+	—	—	—	—	—	—	—	Indo-Malayan	..
5. *Coptotermes gestroi* Wasmann	+	—	—	—	+	—	—	—	Indo-Malayan	..
6. *Coptotermes heimi* (Wasmann) (syn. *C. parvulus* Holmgren)	+	+	+ (India ; W. Pakistan)	—	—	? (Middle Java—needs confirmation)	—	+ (W. Pakistan)	Indo-Malayan	Widely distributed in all-India and W. Pakistan. Probably also in middle Java (Indonesia)—needs confirmation.
7. *Coptotermes travians* Haviland	+	+ (Puri, Orissa)	+ (W. Bengal ; E. Pakistan)	—	+	+ (Malaya ; Indonesia)	—	—	Indo-Malayan	Apparently an eastern species—east of Puri (Orissa), long. *c.* 85°E.
8. *Parrhinotermes khasii* Roonwal & Sen-Sarma	+	—	—	—	—	—	—	—	Indo-Malayan	The genus *Parrhinotermes* is largely Indo-Malayan (5 species : India, Malaya, Indonesia), with one Australian species. The record by Roonwal & Sen-Sarma (1956) is the first record of the genus from India.
Fam. III. TERMITIDAE										
9. *Anoplotermes shillongensis* Roonwal & Chhotani	+	—	—	—	—	—	—	—	Indo-Malayan	The record of Roonwal & Chhotani (1959 ; and 1960, 1962*a*, *c*) is the first record of the genus *Anoplotermes* from India. The genus is largely neotropical (South America and Central America) and Ethiopian (Africa).

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Fam. I. KALOTERMITIDAE										
1. *Neotermes megaoculatus lakhimpuri* Roonwal & Sen-Sarma	+	—	—	—	—	—	—	—	Indo-Malayan	The typical subspecies, *N. m. megaoculatus* Roonwal & Sen-Sarma, occurs in the foothills of the western Himalayas, at Dehra Dun (U.P., India)
2. *Cryptotermes bengalensis* Snyder [= ? *C. havilandi* Sjdt.]	+	—	+ (W. Bengal & E. Pakistan)	—	—	—	—	—	Indo-Malayan	..
Fam. II. RHINOTERMITIDAE										
3. *Reticulitermes chinensis* Snyder (syn. *R. assamensis* Gardner)	+	—	—	—	—	—	+ (Szechuan Province)	—	Iodo-Malayan (Also Palaearctic)	..
4. *Reticulitermes saraswati* Roonwal & Chhotani	+	—	—	—	—	—	—	—	Indo-Malayan	..
5. *Coptatermes gestroi* Wasmann	+	—	—	—	+	—	—	—	Indo-Malayan	..
6. *Captotermes heimi* (Wasmann) (syn. *C. parvulus* Holmgren)	+	+	+ (India ; W. Pakistan)	—	—	? (Middle Java—needs confirmatioo)	—	+ (W. Pakistan)	Indo-Malayan	Widely distributed in all-India and W. Pakistan. Probably also in middle Java (Indonesia)—oeeds confirmatioo.
7. *Coptotermes travians* Haviland	+	+ (Puri, Orissa)	+ (W. Bengal ; E. Pakistan)	—	+	+ (Malaya ; Indo-oesia)	—	—	Indo-Malayan	Apparently ao eastero species—east of Puri (Orissa), long. *c.* 85°E.
8. *Parrhinotermes khasii* Roonwal & Sen-Sarma	+	—	—	—	—	—	—	—	Indo-Malayan	The genus *Parrhinotermes* is largely Indo-Malayan (5 species : India, Malaya, Indonesia), with one Australian species. The record by Roonwal & Seo-Sarma (1956) is the first record of the genus from India.
Fam. III. TERMITIDAE										
9. *Anoplatermes shillongensis* Roonwal & Chhotani	+	—	—	—	—	—	—	—	Indo-Malayan	The record of Roonwal & Chhotani (1959 ; and 1960, 1962*a*, *c*) is the first record of the genus *Anoplotermes* from India. The genus is largely neotropical (South America and Central America) and Ethiopiao (Africa).

TABLE—(*Continued*)

Species	Distribution								Zoogeographical Status	Remarks
	Assam Region (Assam State, NEFA, Manipur, the Naga Hills & Tuensang Area, & Tripura)	Peninsular India (below c. 20°N. latitude)	Rest of India (not covered by cols. 2 & 3, and W. & E. Pakistan	Ceylon	Burma	Rest of Oriental Region	China	Elsewhere		
10. *Speculitermes cyclops rongrensis* Roonwal & Chhotani	+								Indo-Malayan	The species *S. cyclops* Wasmann and its various subspecies (*vide* Roonwal & Sen-Sarma 1960, pp. 16-26) are entirely Indo-Malayan (all-India; Ceylon; and Burma)
11. *Synhamitermes quardriceps* (Wasmann)	+	+ (Maharashtra)	+ (Rajasthan)	+					Indo-Malayan	..
12. *Microcerotermes heimi* Wasmann	+	+ (Maharashtra, & Mysore States)							Indo-Malayan	..

13. *Pseudocapritermes tikadari* Roonwal & Chhotani	+	—	—	—	—	—	—	—	Indo-Malayan	..
14. *Capritermes dumensis* Roonwal & Sen-Sarma	+	—	+ (Dehra Dun, U.P.)	—	—	—	—	—	Indo-Malayan	..
15. *Capritermes latignathus durga* Roonwal & Chhotani	+	—	—	—	—	—	—	—	Indo-Malayan	The typical subspecies, *C. latignathus latignathus* Holmgren, is from Java.
16. *Macrotermes khajuriai* Roonwal & Chhotani	+	—	—	—	—	—	—	—	Indo-Malayan	..
17. *Odontotermes assamensis* Holmgren	+	—	—	—	—	—	—	—	Indo-Malayan	..
18. *Odontotermes feae* (Wasmann)	+	+ (Maharashtra State)	+ (Bengal)	—	+	—	—	—	Indo-Malayan	..
19. *Odontotermes flavomaculatus* Holmgren & Holmgren	+	—	—	—	—	—	—	—	Indo-Malayan	..
20. *Odontotermes giriensis* Roonwal & Chhotani	+	—	—	—	—	—	—	—	Indo-Malayan	..
21. *Odontotermes horai* Roonwal & Chhotani	+	—	—	—	—	—	—	—	Indo-Malayan	..
22. *Odontotermes horni* (Wasmann)	+	+ (Mysore State)	+ (U.P.; W. Bengal)	+	—	—	—	—	Indo-Malayan	..